Avoiding Procedural Sedation Misadventures

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Objectives

- Identify high risk patients for procedural sedation
- Know the potential adverse events of procedural sedation
- Procedural sedation set-up for success
- Procedural sedation misadventure toolkit

Main objective is to help you feel comfortable and confident with **ANY** procedural sedation!

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PROGRESSIVE CLINICAL PRACTICE

Incidence of Adverse Events in Adults Undergoing Procedural Sedation in the Emergency Department: A Systematic Review and Meta-analysis

M. Fernanda Bellolio, MD, MS, Waqas I. Gilani, MD, Patricia Barrionuevo, MD, M. Hassan Murad, MD, MPH, Patricia J. Erwin, MLS, Joel R. Anderson, James R. Miner, MD, and Erik P. Hess, MD, MSc

- Agitation, apnea (12.4), aspiration (1.2), bradycardia, bradypnea, hypotension (15.2), hypoxia (40.2), intubation (1.6), laryngospasm (4.2), and nausea/vomiting (16.4)

Adverse Event	Studies	Overall Incidence (Per 1,000 Sedations)	Meds with Highest Rate of Adverse Event
Agitation	33 Studies/6,631 Sedations	9.8 (95% CI 6.1 - 13.5)	Ketamine Ketamine/Propofol
Apnea	22 Studies/3,264 Sedations	12.4 (95% CI 7.9 - 233.5)	Midazolam Midazolam/Opiate
Aspiration	10 Studies/2,370 Sedations	1.2 (95% CI 0 - 2.6)	---
Bradycardia	5 Studies/837 Sedations	6.5 (95% CI 1.1 - 11.8)	Etomidate Midazolam/Opiate
Hypotension	27 Studies/5,801 Sedations	15.2 (95% CI 10.7 - 19.7)	Propofol Midazolam/Opiate
Hypoxia	42 Studies/7,116 Sedations	40.2 (95% CI 32.5 -47.9)	Propofol Midazolam/Opiate
Intubation	19 Studies/ 3,636 Sedations	1.6 (95% CI 0.3 - 2.9)	---
Laryngospasm	5 Studies/883 Sedations	4.2 (95% CI 0 - 8.5)	---
Vomiting	25 Studies/3,319 Sedations	16.4 (95% CI 9.7 - 23.0)	Ketamine

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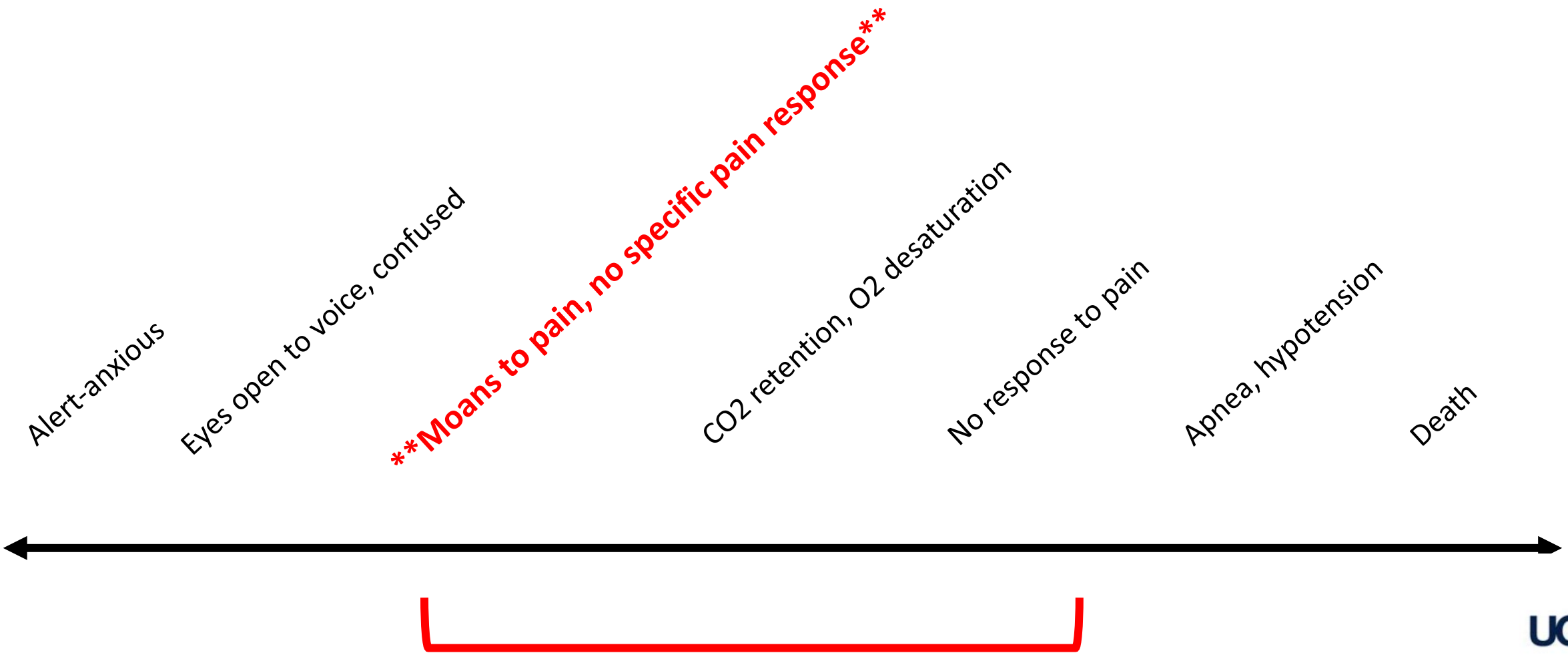
Finding the sweet spot

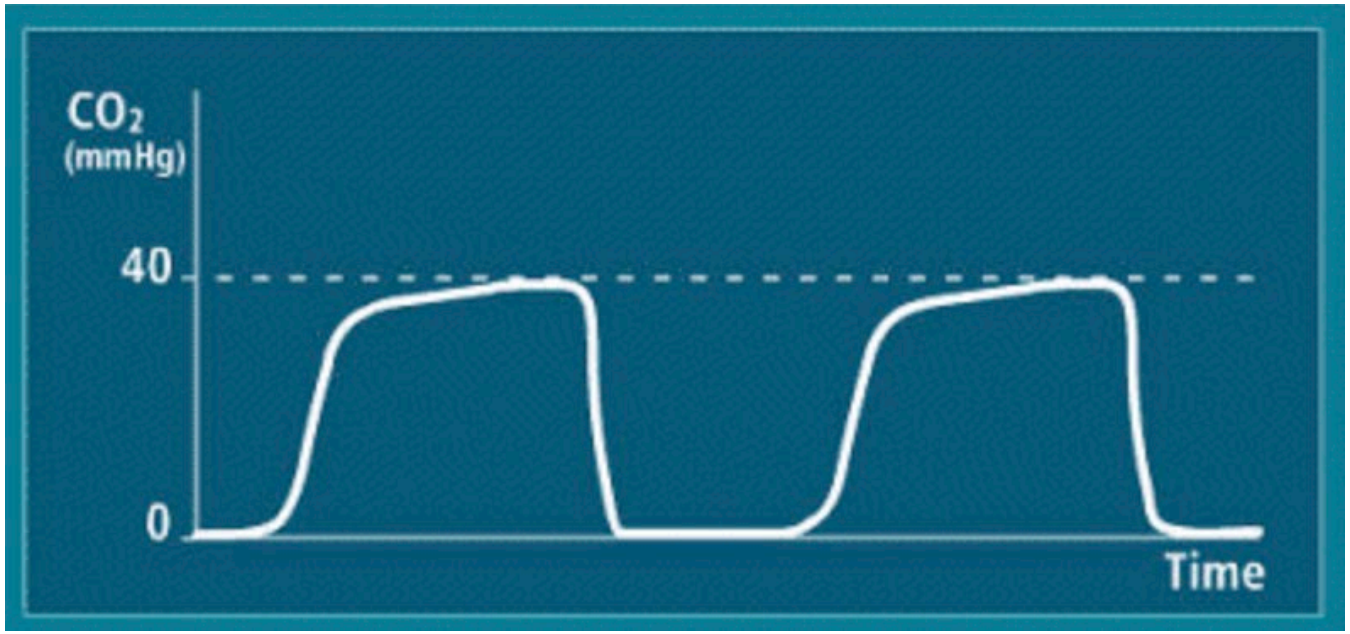


Identifying the high-risk patient

- ASA classification
- Issues oxygenating or ventilating
- Neck immobility
- Obesity
- Facial trauma
- Poor mouth opening
- Hemodynamic instability

Common Issues encountered

- NPO status?
- Low risk procedure?
- Does age matter?
- O2 sat good?
- Hypoventilation/apnea
- Laryngospasm



Set-up for success

- Ideally 3 people in room
- IV, O2, Monitor with capnography
- Suction
- BVM, OP/NP
- Intubation supplies and medications
- IVF running
- Extra sedation medications/Benzodiazepines
- Pre-treat with anti-emetic (especially ketamine)

Case 1:
Scooter vs Auto

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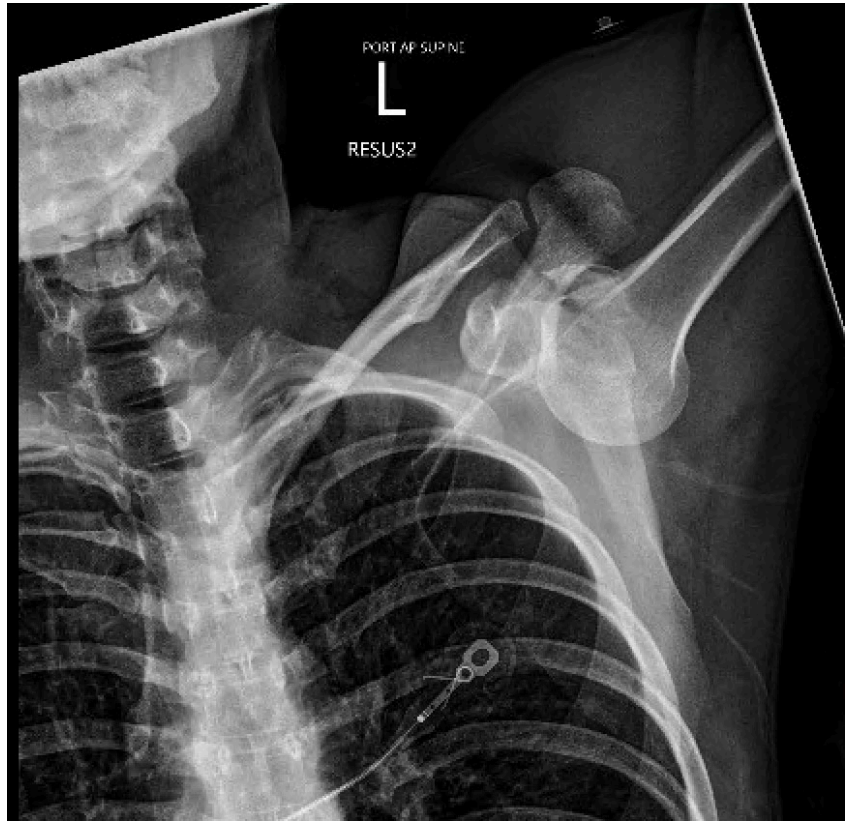
32 y.o. s/p car vs moped

- Tachycardic with labile pressures
- Facial abrasions/lacerations, L knee deformity, L abd/flank bruising, L arm held above head
- GCS 15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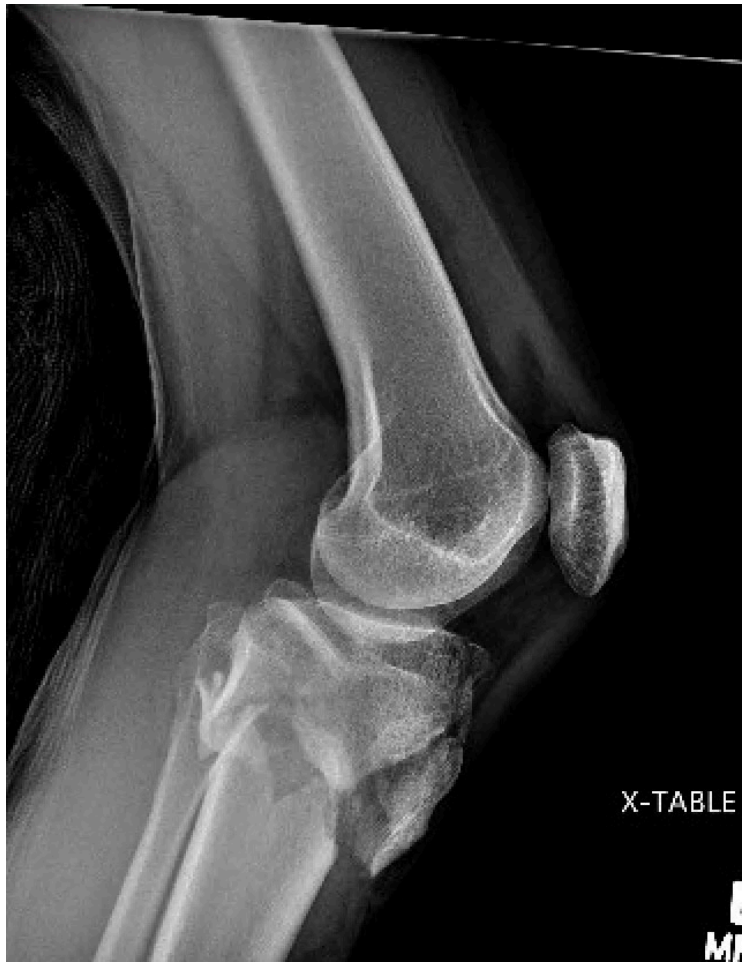
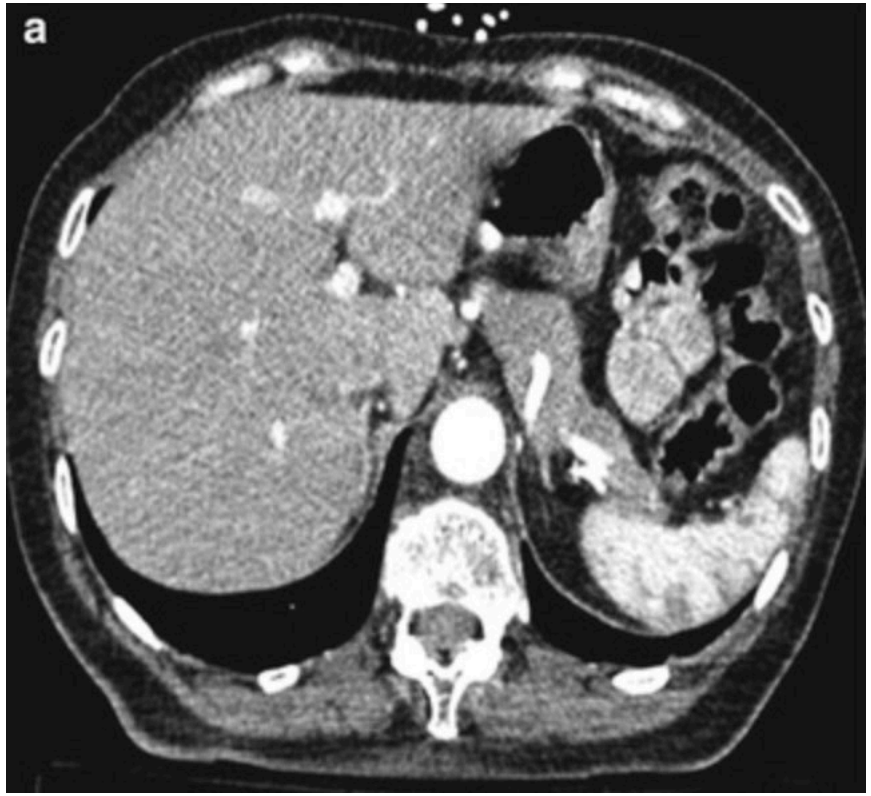

X-TABLE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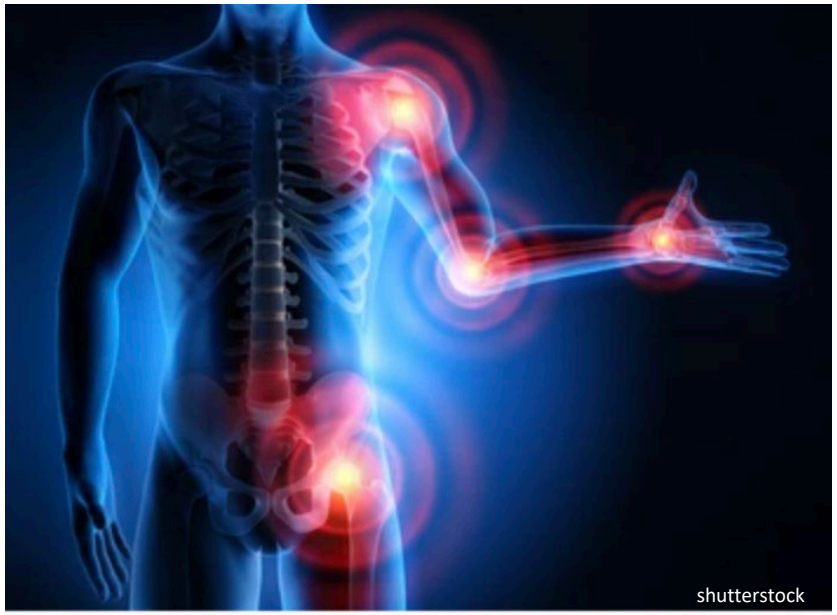
PSA for Orthopedic Procedures

- Drug of Choice?
- Ketamine 1.5 mg/kg IV
  - Had received several doses of fentanyl previously and zofran
- Patient became rigid- clenched jaw, statue like arms



Ketamine induced catalepsy

Now What?

- Benzo's??

- Converted to Ketamine plus Propofol
- Half dose of each (~0.5 mg/kg IV)
- Decreased risk profile for each medication
  - Hypotension, respiratory depression, emesis, emergence reaction

- Hypoventilation/apnea

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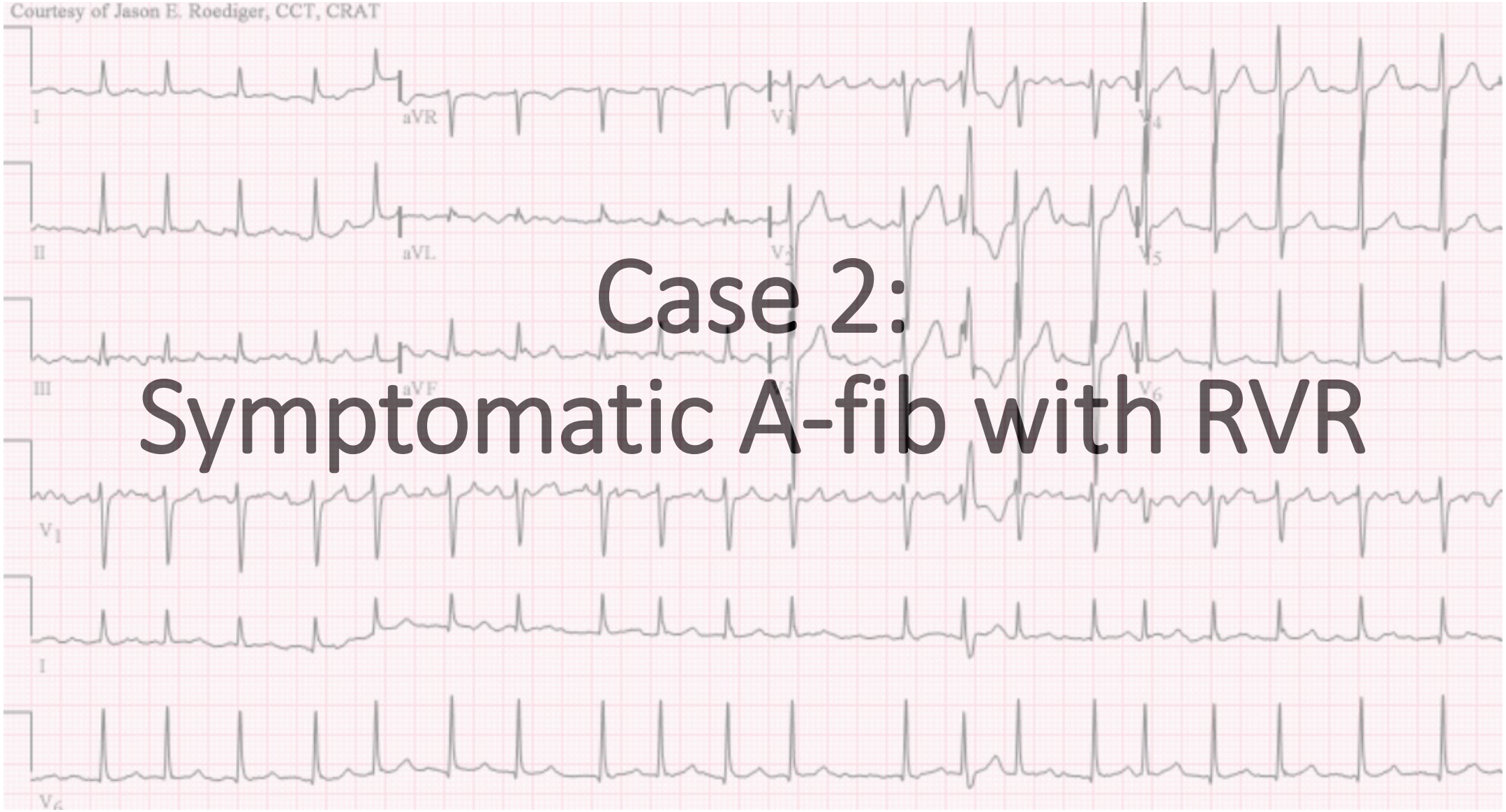

Case 2:
Symptomatic A-fib with RVR

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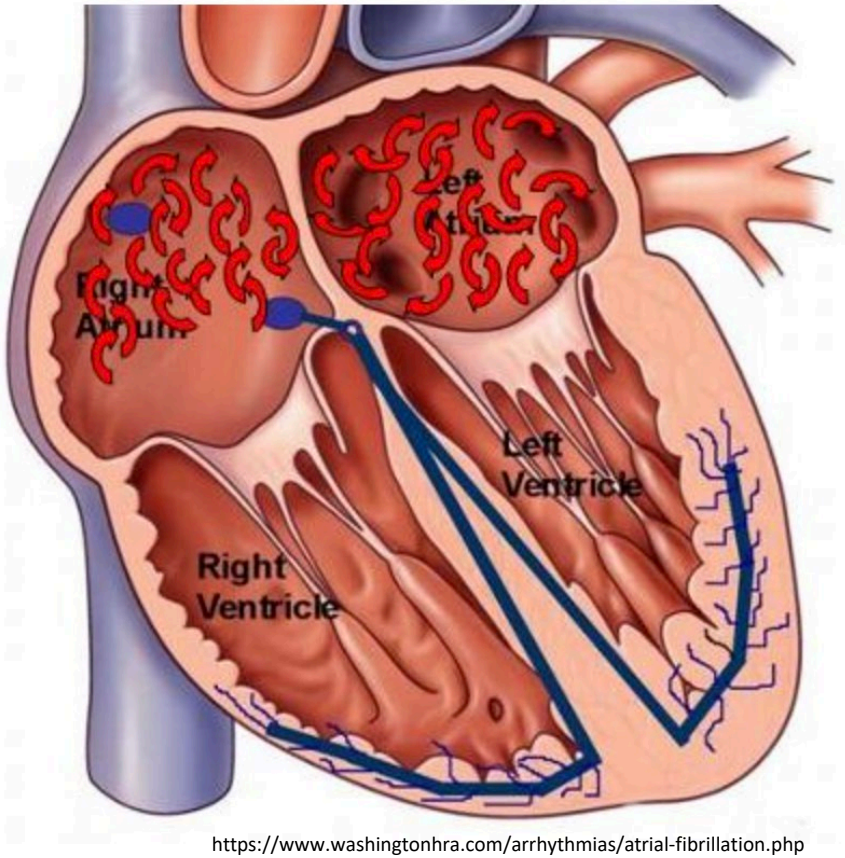
75 y.o. p/w chest pain and shortness of breath

- Found to be in A-fib with RVR
- Labile blood pressure
- Tachypneic, hypoxic, very uncomfortable



https://www.washingtonhra.com/arrhythmias/atrial-fibrillation.php

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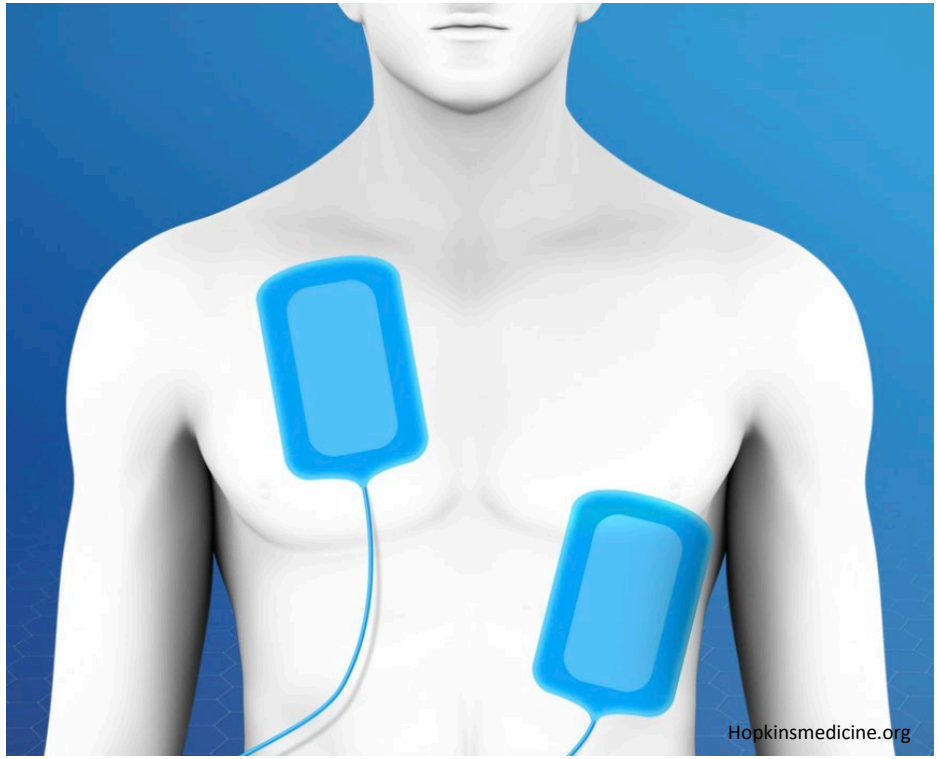
PSA for cardioversion

- Drug of choice?
- Etomidate 0.1mg/kg IV given
  - Fentanyl 50mcg IV given for pain



- The nurse yells, “the patient is having a seizure!”
  - Give BZ’s?
- Pt successfully cardioverted, all hemodynamics stabilize

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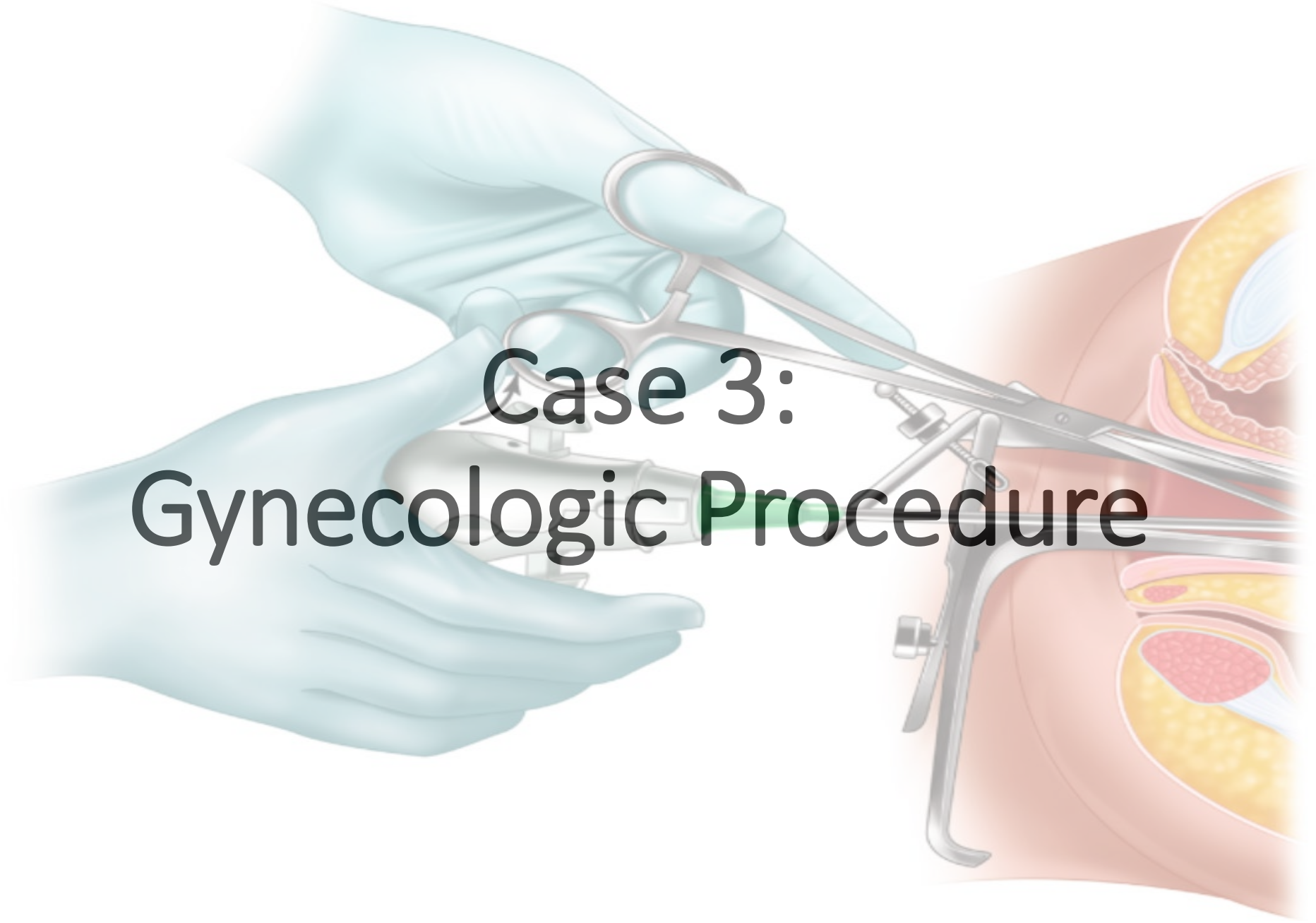
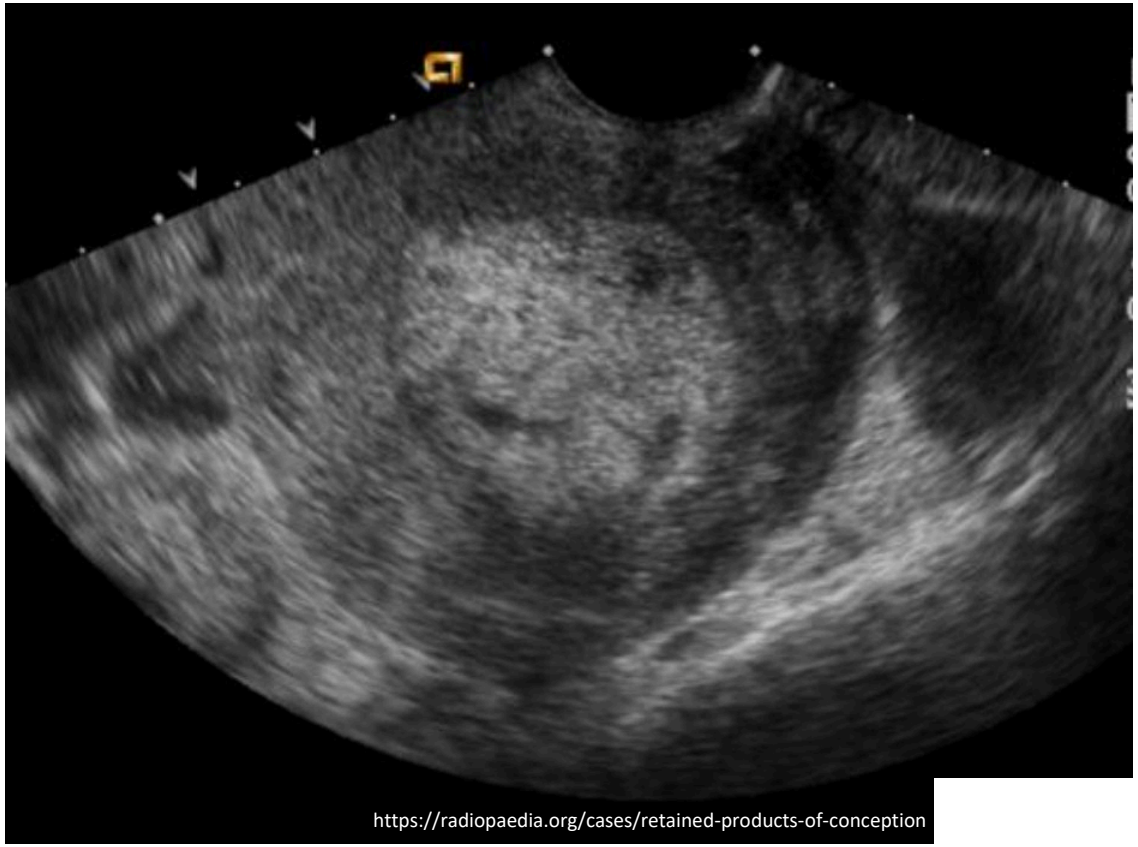


Case 3:
Gynecologic Procedure

34 y.o. F s/p miscarriage p/w vaginal bleeding

- Tachycardic and very anxious
- Bedside US with retained products of conception
- Gyn consulted and wants to do a bedside MUA



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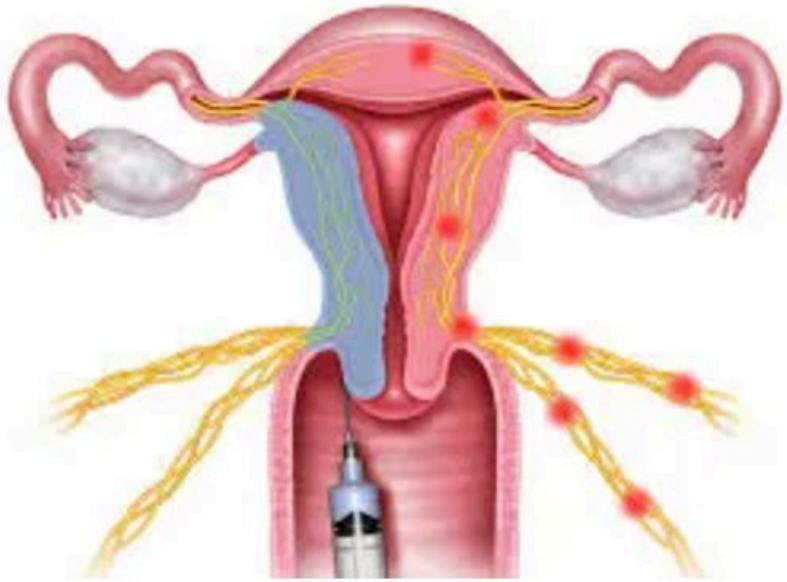
PSA for gynecologic procedure

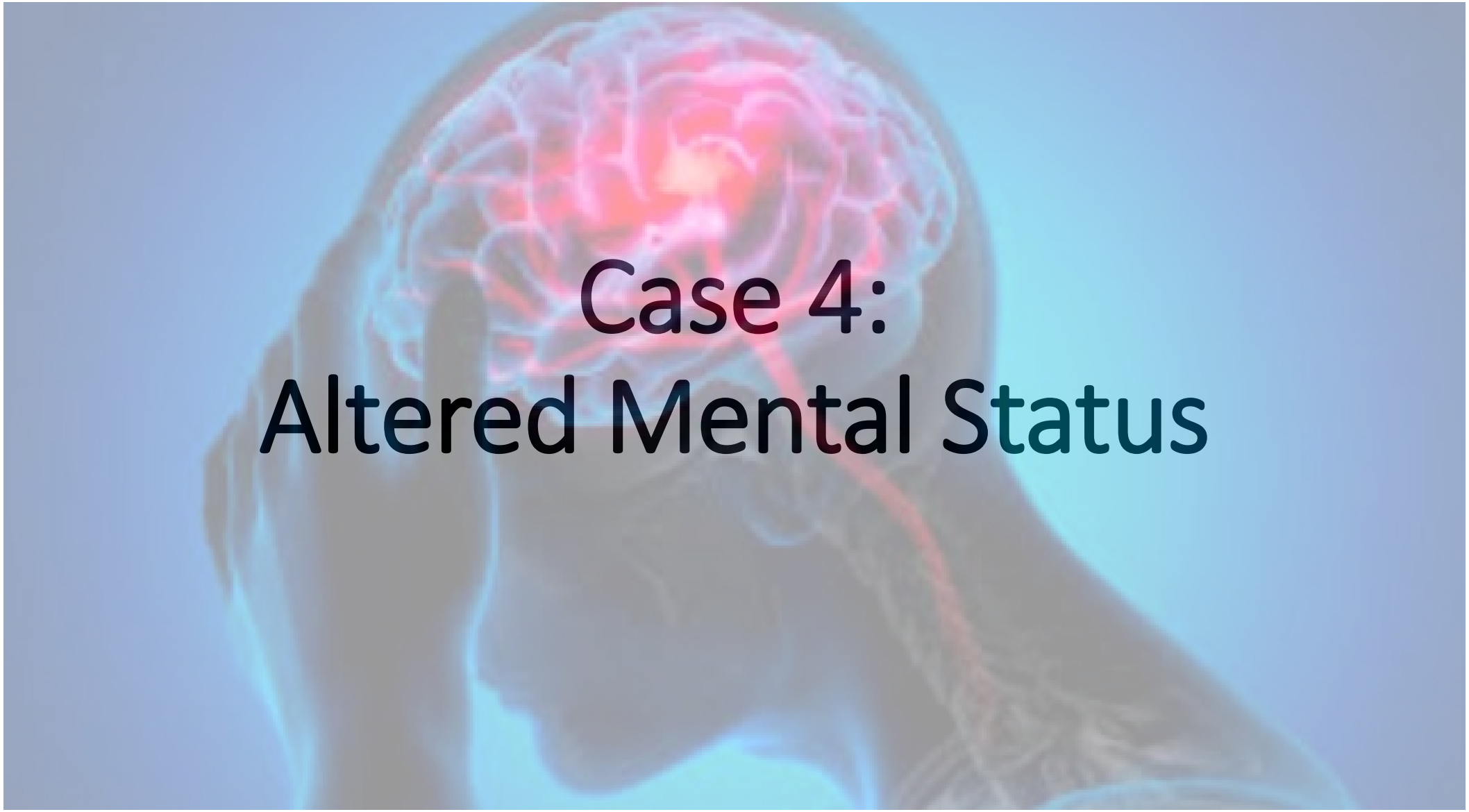
- Drug of choice?

- Versed 2mg IV/fentanyl 50mcg
  - Fine balance between screaming in pain and not breathing

- MUA successful
  - Longer observation period with constant stimulation required



https://medika.life/pudendal-and-paracervical-blocks/



Case 4:
Altered Mental Status

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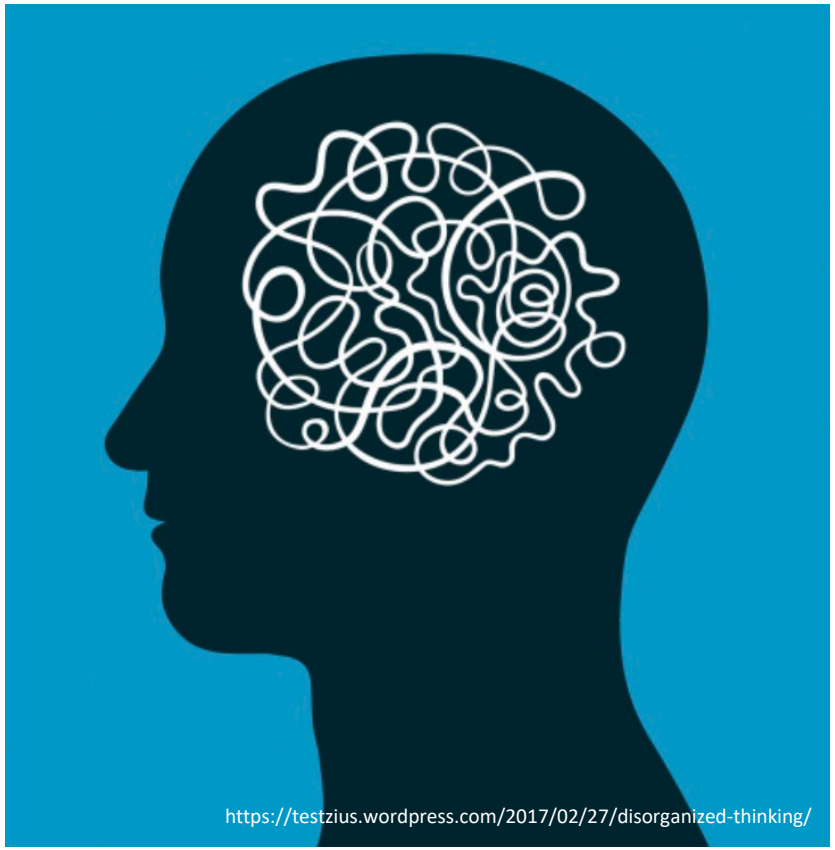
54 y.o. p/w disorganized thoughts and butt infection

- Hyperverbal, motor agitation, passive SI
- Butt swelling and pain
- Tachycardic, hypertensive
  - Used crack cocaine early this morning



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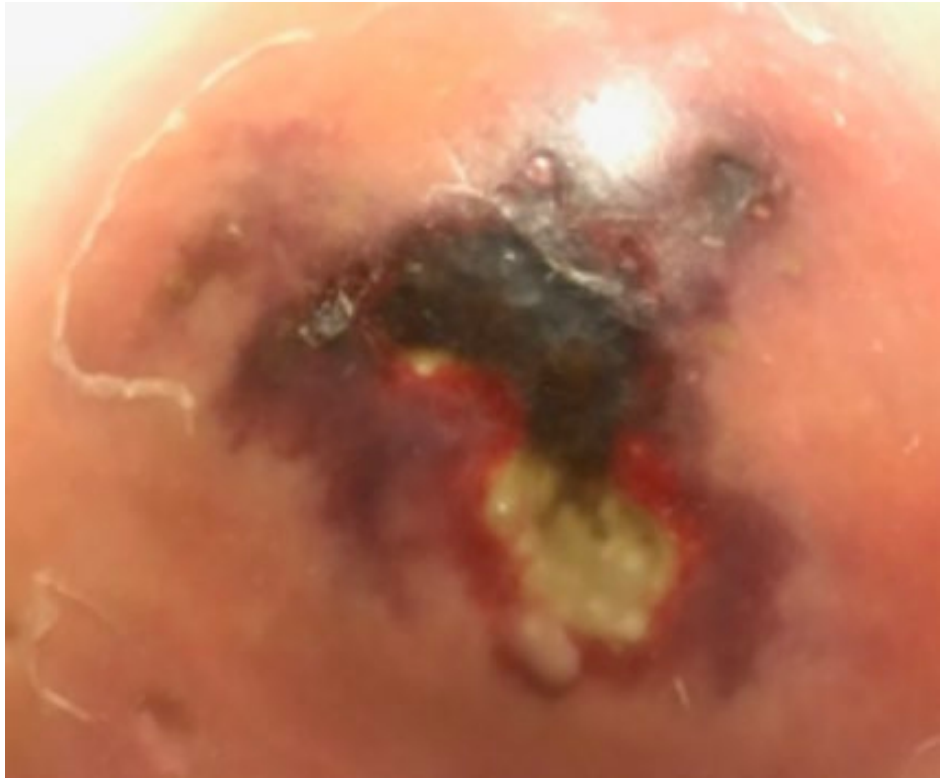
The story unfolds

- Necrotizing Fasciitis of the buttock
- New Renal Failure with hyperkalemia
- Diabetic ketoacidosis



SICK, SICK, SICK

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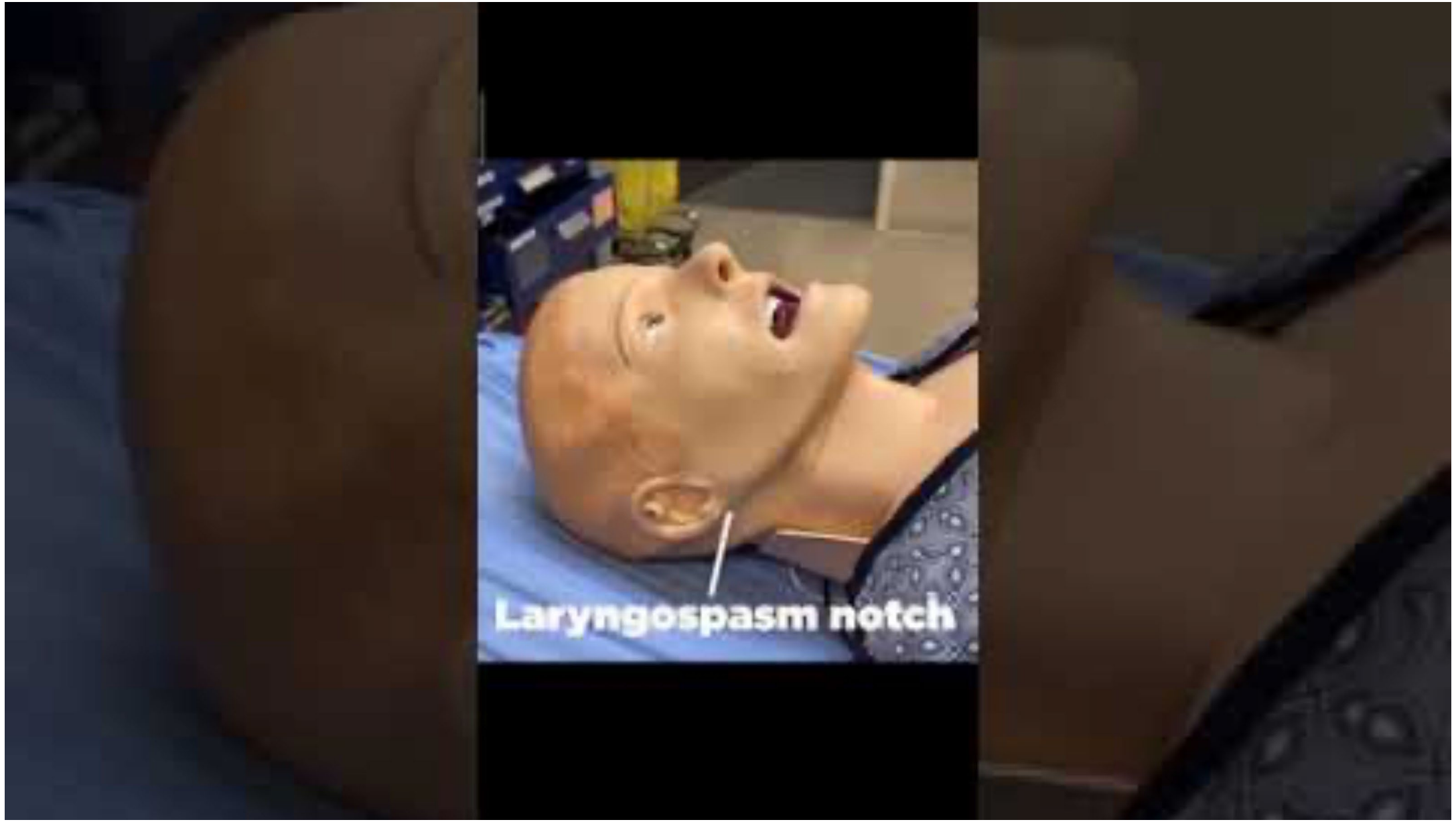
PSA for line placement

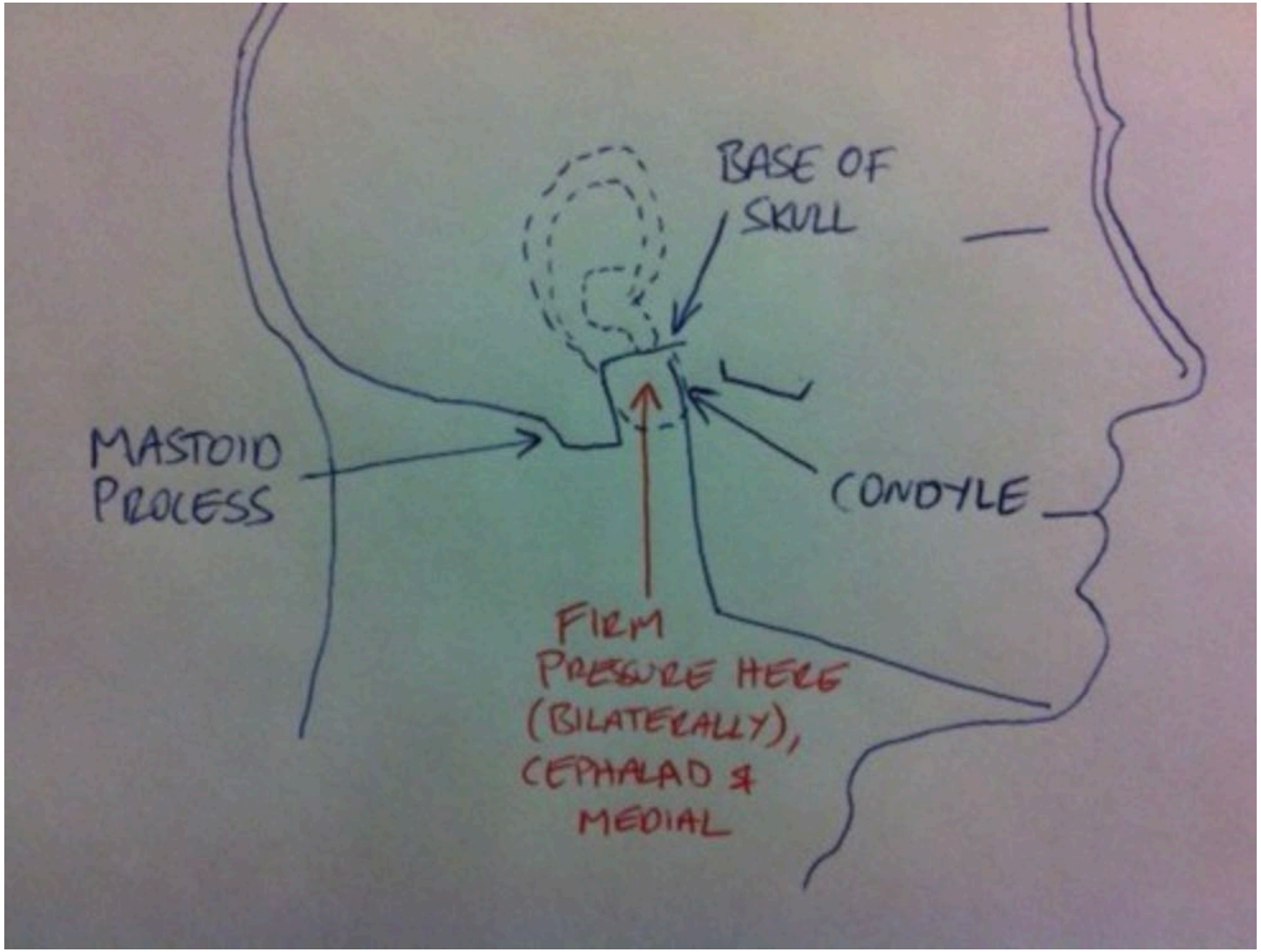
- Drug of choice?

- Ketamine 1.5 mg/kg IV
- Difficulty sedating patient and high pitched inspiratory sound
  - Oscillates between ”fighting ketamine” and being “passed out”

- Now what?


Laryngospasm notch

Larson Maneuver



https://anaesthesianews.wordpress.com/2018/02/06/the-laryngospasm-notch-technique-larson-maneuver/

Take Home Points

- Identify high risk patients
- Choose your drugs wisely/know the adverse effects
- Think of PSA as a high-risk procedure and ALWAYS be ready to intubate if needed

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Questions?

References

- Bhatt M, Johnson DW, Chan J, Taljaard M, Barrowman N, Farion KJ, Ali S, Beno S, Dixon A, McTimoney CM, Dubrovsky AS, Sourial N, Roback MG; Sedation Safety Study Group of Pediatric Emergency Research Canada (PERC). Risk Factors for Adverse Events in Emergency Department Procedural Sedation for Children. JAMA Pediatr. 2017 Oct 1;171(10):957-964. doi: 10.1001/jamapediatrics.2017.2135. PMID: 28828486; PMCID: PMC5710624.
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